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(56) Documents Cited

GB 2298911 A GB 2289750 A GB 1466854 A
GB 1048308 A EP 0276918 A1 DE 003112729 A1
US 5394786 A

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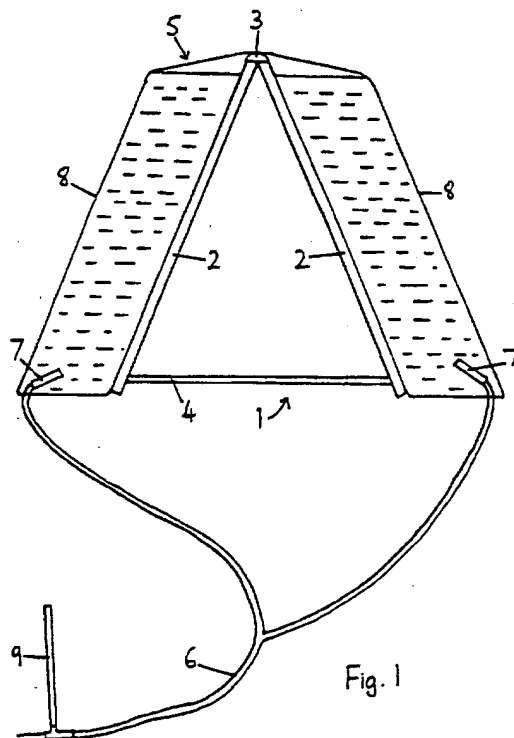
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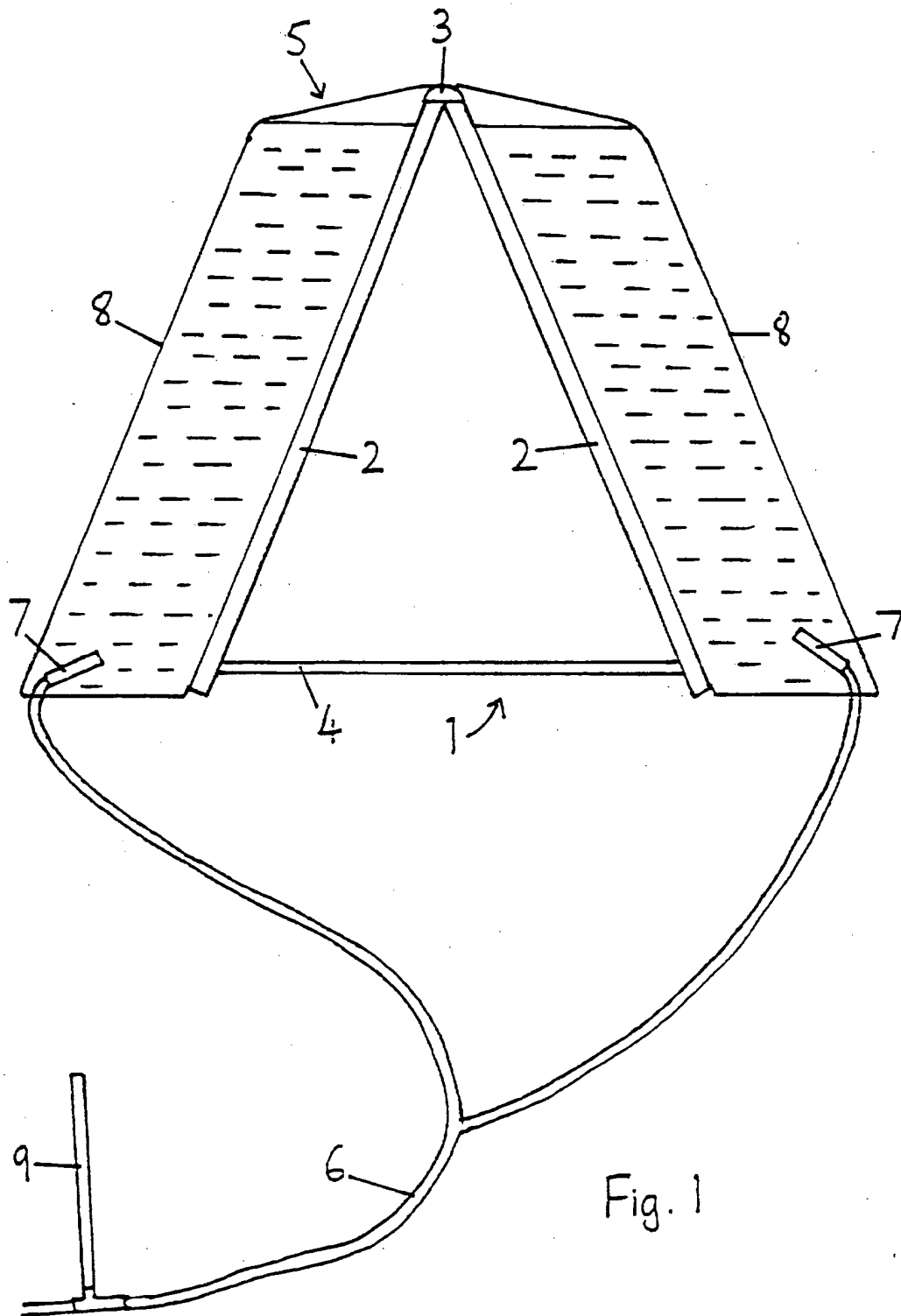
Explosion-suppressing barriers

(57) An explosion-suppressing barrier comprises a rigid frame such as a collapsible easel 1. A polythene saddlebag 5 is suspended over the easel to form two water-filled bags 8. An integral hose 6 may be used for filling the bags. In alternative embodiments, the easel 1 is laid on its side and water-filled bags are draped over it, or an alternative easel comprises vertical sections joined by ropes to form a "box".



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EXPLOSION-SUPPRESSING BARRIERS

This invention relates to barriers for suppressing the effects of explosions. The invention can be used to impede material ejected from explosions, particularly for the protection of persons or equipment from exploding shells, mines and bombs.

The present invention is a further development of the inventions disclosed in my International Patent Application No WO95/08749 and my British Patent Applications Nos 2,292,997 and 2,294,105 which describe aerosolizing liquid contained in rupturable containers.

This application is divided out of Application No. 9713514.9 which relates to an explosion-suppressing barrier comprising a wall of blocks defining or supporting at least one rupturable container filled with liquid which is aerosolized in use, and a method of protecting a given location comprising erecting such a barrier.

The present invention provides a free-standing explosion-suppressing barrier comprising a rigid frame supporting at least one rupturable container filled with liquid which is aerosolized in use.

The frame may comprise a collapsible easel.

In preferred embodiments of the invention a plurality of rupturable containers comprise bags which may be formed from layflat tubing of polythene or other plastic and which are preferably mounted on opposite sides of the frame.

An integral hose or manifold of flexible tubing may be provided for filling the container(s) with liquid.

The invention also provides a method of protecting a given location from the effects of an explosion, comprising

erecting a rigid frame between the given location and the site of the explosion, the frame supporting at least one rupturable container filled with liquid which is aerosolized by the explosion. Further rupturable liquid containers may
5 be supported on said frame after erection thereof.

The invention will now be described in more detail, by way of example only, with reference to the accompanying drawing, the single figure of which is a schematic view, partly in section, of a barrier according to an embodiment
10 of the invention.

The figure shows an easel 1 comprising two sections 2 of light timber hollow core door material, such as that manufactured by John Carr & Co of Leeds. Alternative materials which can be used for the easel include standard
15 50mm plastic plumber's piping and fittings. However, hollow core door material is less expensive and is therefore preferred, particularly since the barrier is destroyed in use.

The two easel sections 2, which in this example each
20 measure 0.9m x 1m, provide the main supports of the easel 1. Each section 2 is cut at an angle along its upper edge and a length of half-round cardboard 3 is taped along the juxtaposed upper edges. The half-round cardboard 3 covers any sharp edges which could otherwise puncture the saddlebag
25 described below.

Holes are drilled through the easel section 2 near their lower ends, by means of which a polypropylene rope bracer 4 is tied between the sections. The bracer 4 maintains an optimum angle of 45° between the easel sections 2.

30 A saddlebag 5 is manufactured from polythene layflat tubing, preferably 760mm wide and 250µm thick but optionally of differing widths and up to 300µm thick. The upper limit to the size of the saddlebag 5 is determined by the weight

of water which can be safely supported by the easel 1.

The saddlebag 5 is manufactured by welding closed both ends of a suitable length of layflat tubing. A branch of a filling hose 6, formed from 40mm or 50mm layflat polythene tubing, is connected in a liquid-tight manner to each end of the saddlebag 5 and one-way valves 7 are fitted at the ends of the hose 6 within the saddlebag 5. Two small vent holes (not shown) are formed in the saddlebag on either side of its centre line.

10 The saddlebag 5 is then draped over the easel 1, thus forming two individual bags 8, one on each side of the easel. The saddlebag is secured to the easel using double sided adhesive tape and the branched hose 6 is carefully rolled up and temporarily taped to the side of the easel 1.

15 Filling of the bags 8 takes place remotely via the hose 6 which is firstly unrolled and connected to a water tanker or mains water supply (not shown). A pressure limiter 9 ensures that the elements downstream therefrom are not ruptured. When the bags have been filled the barrier is as
20 shown in Figure 1, at which point the hose 6, which is no longer required, can be removed. It will be appreciated that in order to form a barrier of suitable length, a number of easels 1 are placed end to end and a saddlebag 5 is draped over each easel.

25 In an alternative embodiment, not shown in the drawings, which is suitable for use on sloping or highly uneven ground, the easel 1 is laid on its side with the open end facing towards a munition to be exploded. Three saddlebags are draped over the easel, one over each section
30 2 and a third narrower saddlebag over the centre of the easel. Instead of the hose 6, the saddlebags are filled from a common manifold connected to the two outer bags in the open frontal region. The centre saddlebag is interconnected at its base to the two outer saddlebags both

on the inner and outer sides of the easel. To facilitate even filling, further interconnections between the saddlebags are made through the easel sections. As the outer saddlebags fill, the centre saddlebag is automatically
5 filled.

In a further alternative embodiment, the easel sections do not lean against each other but stand vertically. Holes are drilled both at the upper and lower edges of the easel sections. Polypropylene rope bracers are then tied to the
10 sections using the holes, a first bracer connecting the upper hole of the first easel section to the lower hole of the second section and a second bracer connecting the lower hole of the first easel section to the upper hole of the second section such that the bracers cross and a "box" is
15 formed from the easel sections. One saddlebag is suspended over each of the easel sections and the four individual bag filling points are all connected to a common manifold which is filled remotely from a hose formed from polythene layflat tubing.

20 The easels can be stacked flat for transportation and storage. Several hundred easels could be transported and stored in a 6 meter long container. For training purposes where explosives are not detonated, the easels can be re-used, however the polythene saddlebags and manifolds should
25 be replaced after such use.

During the planning stage of a barrier according to the invention, the ultimate degree of protection required should be ascertained so that the appropriate barrier can be constructed.

CLAIMS

1 A method of protecting a given location from the
effects of an explosion, comprising erecting a rigid frame
between the given location and the site of the explosion,
5 the frame supporting at least one rupturable container
filled with liquid which is aerosolized by the explosion.

2 A method according to claim 1, comprising the
additional step of supporting further rupturable liquid-
filled containers on said frame after erection thereof.

10 3 An explosion-suppressing barrier comprising a
rigid frame supporting at least one rupturable container
filled with liquid which is aerosolized in use.

4 A barrier according to claim 3, wherein the frame
comprises a collapsible eased.

15 5 A barrier according to claim 4, wherein the eased
is of hollow core door material.

6 A barrier according to claim 3, 4 or 5, comprising
a plurality of rupturable bags of liquid.

20 7 A barrier according to claim 6, wherein said bags
are formed from layflat polythene tubing.

8 A barrier according to claim 6 or 7, wherein said
bags are mounted on opposite sides of the frame.

9 A barrier according to any one of claims 3 to 8,
wherein an integral hose or manifold is provided for filling
25 the container(s) with liquid.

10 An explosion-suppressing barrier, substantially as
described herein or with reference to the accompanying
drawing.



Application No: GB 9918176.0
Claims searched: 1 to 10

Examiner: Trevor Berry
Date of search: 23 September 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.Q): F3C (CP2, CPK): A5A (A37): B8K (KAA)

Int CI (Ed.6): F41H, F42D

Other: ONLINE: EPODOC, JAPIO, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
P, X	GB 2298911 A PARKES-note support 3	3, 6-8
X	GB 2289750 A PARKES-note rungs 14 in figure1	1, 3, 6-8
X	GB 1466854 FORREST-note support 1	3
X	GB 1048308 WEISBURG	3, 4
X	EP 0276918 A1 CUBE OVERSEAS-see figure 9	1, 3
X	US 5394786 GETTLE-note figure 2	1, 3
X	DE 3112729 A1 MBB-note support 5	1, 3, 6

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

& Member of the same patent family

A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.
E Patent document published on or after, but with priority date earlier than, the filing date of this application.